

REMARKS

This application has been carefully reviewed in light of the Office Action dated June 23, 2004. Claims 40 to 55 are in the application, of which Claims 40 and 48 are independent. Claims 15, 16, and 20 to 39 have been cancelled. Reconsideration and further examination are respectfully requested.

Claims 29 to 32 were rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite. Specifically, the Office Action contended that the term “photoconductor” was unclear, and suggested that the term, as used in Claim 30, was used to mean “light guide” or “light transmissive”. In keeping with the Examiner’s suggestion, the specification has been amended to recite the term “light guide plate” instead of “photoconductor”. In addition, newly-added Claims 40 to 55 use the term “light guide plate”. It is believed that the description of embodiments 2, 3 and 4, as well as Figures 11-13, support this amendment.

Regarding Claims 30 and 32, the Office Action also contended that it was unclear which portion of the photoconductor is the “side face”, and as such the relative location of the light source is unclear. Applicant disagrees and respectfully asserts that “side face” has a meaning clear to those skilled in the art, and that such a meaning is consistent with and apparent from a reading of the specification. As such, the newly added claims are believed to comply with § 112. Accordingly, reconsideration and withdrawal of the § 112 rejections are respectfully requested.

Claims 15, 16, 20 to 27, 32, 34 and 37 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,905,772 (Rutten). Claims 28 to 31 and 33 were rejected

under 35 U.S.C. § 103(a) over Rutten in view of U.S. Patent No. 5,777,335 (Mochizuki). Claims 35, 36, 38 and 39 were rejected under 35 U.S.C. § 103(a) over Rutten in view of U.S. Patent No. 4,737,653 (Nakagawa). Claims 15, 16 and 20 to 39 have been cancelled in favor of newly-added Claims 40 to 55. This action has been taken without prejudice or disclaimer of subject matter and without conceding the correctness of the rejections. Consideration and examination of the newly-added claims are respectfully requested.

The present invention relates to radiation detection and image data processing. A radiation source is used to irradiate a subject, such as a hospital patient, during an image-pickup period. The radiation that is passed through the subject is converted by photoelectric conversion elements into electrical signals that represent an image. In addition to a radiation source, a light source is used to project light to the photoelectric conversion elements during a non-image-pickup period so as to reduce a dark current produced by the photoelectric conversion elements. This light source is arranged along a side face of a light guide plate. Control means are used to drive the radiation source during the image-pickup period and the light source during the non-image pickup period.

By using a light source during a non-image-pickup period, the present invention reduces the dark current of the photoelectric conversion elements. In addition, by using a the light source during a non-image-pickup period, the present invention shortens the time needed to reduce the dark current, as the radiation source is ordinarily not needed for the reduction. Furthermore, the use of a light guide plate allows for the use of a decreased number of light sources. In addition, because of the arrangement of the light

source on a side face of the light guide plate, the light guide plate prevents the light source from being directly irradiated by radiation transmitted from the radiation source through the photoelectric conversion elements, thereby reducing adverse effects on the light source from the radiation.

With specific reference to the claims, independent Claim 40 recites an image data processing system comprising a photoelectric conversion device which includes a substrate provided with a plurality of photoelectric conversion elements and a light source for radiating light rays having no image data to a plurality of the photoelectric conversion elements. The system further comprises a radiation source and control means for independently controlling the radiation source, the light source and the photoelectric conversion devices. The control means drives the radiation source during an image-pickup period and drives the light source during a non-image-pickup period. In addition, the system also comprises a light guide plate. The light source is arranged on a side face of the light guide plate.

The applied references are not seen to teach or suggest the features of independent Claim 40, and in particular, are not seen to teach or suggest at least the feature of a light guide plate, wherein a light source is arranged on a side face of the light guide plate.

Rutten relates to an X-ray examination apparatus with a semiconductor X-ray detector. Rutten is seen to teach an X-ray examination apparatus that has an X-ray sensor matrix 4 having a plurality of photodiodes 21 (column 5, lines 58-67; column 6, lines 45-50; Figs. 1 and 2). In addition, Rutten is seen to teach a bias light source 5 (Fig.

1). This bias light source may incorporate a number of semiconductor laser diodes, light emitting diodes, or an electro-luminescent foil (column 6, lines 15-20). Rutten is further seen to teach that the bias light source can be arranged to emit dark-read light or infrared radiation onto a diffusive screen 42 (column 7, lines 46-53; Fig. 4). However, nothing in Rutten is seen to suggest that diffusive screen 42 is a light guide plate, muchless that the bias light source is arranged on a side face of a light guide plate.

The remaining art applied against the claims, namely Mochizuki and Nakagawa, is not seen to supply what is missing from Rutten. Accordingly, based on the foregoing amendments and remarks, independent Claim 40 is believed to be allowable.

According to another aspect of the present invention, independent Claim 48 recites a radiation detection apparatus comprising a plurality of photoelectric conversion elements, a light source for radiating a light ray, the light producing a wavelength including a wavelength region of light absorption of the photo electric conversion elements, and a light guide plate, wherein the light source is arranged on a side face of the light guide plate.

The applied art is not seen to teach or suggest the features of independent Claim 48, and in particular is not seen to teach or suggest at least the feature of a light guide plate, wherein the light source is arranged on a side face of the light guide plate.

Referring to the arguments made above, Rutten is seen to teach a bias light source used in conjunction is a diffusive screen. However, nothing in Rutten is seen to suggest that diffusive screen 42 is a light guide plate, muchless that the bias light source is arranged on a side face of a light guide plate.

The remaining art applied against the claims, namely Mochizuki and Nakagawa, is not seen to supply what is missing from Rutten. Accordingly, based on the foregoing amendments and remarks, independent Claim 48 is believed to be allowable.

The other claims in the application are each dependent from the independent claims and are believed to be allowable over the applied references for at least the same reasons. Because each dependent claim is deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

No other matters being raised, it is believed that the entire application is fully in condition for allowance, and such action is courteously solicited.

Applicant's undersigned attorney may be reached in our Costa Mesa, California office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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